# TAXONOMY OF THE *VERBESINA VIRGINICA* COMPLEX (ASTERACEAE)

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The *Verbesina virginica* complex contains three taxa, *V. virginica* L. var. *virginica, V. v.* var. *laciniata* (Poir.) Gray and *V. microptera* DC., in the widespread tropical section *Ochractinia*. The complex has been a source of taxonomic confusion for some time. This confusion has arisen over the segregation of the southwestern United States taxon, *V. microptera*, from the more widespread *V. virginica* and the segregation of the southeastern populations of *V. virginica* at either the specific or the varietal levels.

*Verbesina microptera* DC. was described from a south Texas Berlandier collection (no. *1442*) in 1836. Gray (1883) and Stanford (1976) considered this name synonymous with *V. virginica*, while Correll and Johnston (1970) treated the two taxa as distinct species, though suggesting they are conspecific.

These two taxa are commonly distinguished by the number of wings on the stem and the extent to which these wings continue into the inflorescence. Examination of herbarium material quickly shows these characters are completely unsatisfactory; the number of wings and their extent varies with the robustness of the plant and ranges from none to six in all taxa of this complex.

Coleman (1977) has performed experimental crosses on populations of all three taxa in this group and recognized *V. virginica* and *V. microptera* as distinct species while maintaining the southeastern United States populations as a variety of the former. He also points out the differing number of ray florets that distinguish between *V. microptera* (10–13) and *V. virginica* (1–5).

My examinations of herbarium and living material supports the conclusions of Coleman (1977). Furthermore, *V. microptera* is geographically isolated from *V. virginica*, the former largely restricted to the region south of San Antonio, Texas, and extending into Coahuila and Nuevo Leon, Mexico, and the latter occurring from west of Austin, Texas, north to Kansas and east to the Carolinas (Figure 1). Correlated with this geographic break (Figure 2) is a distinct morphological boundary as noted by Coleman. *Verbesina virginica* usually has three ray florets (always less than seven) with 10–13 disc florets, while *V. microptera* usually has 11 ray florets (always more than nine) with ca. 25 disc florets. No exceptions to this meristic difference have been detected in the specimens examined.

*SIDA 8(2): 128–134. 1979.*

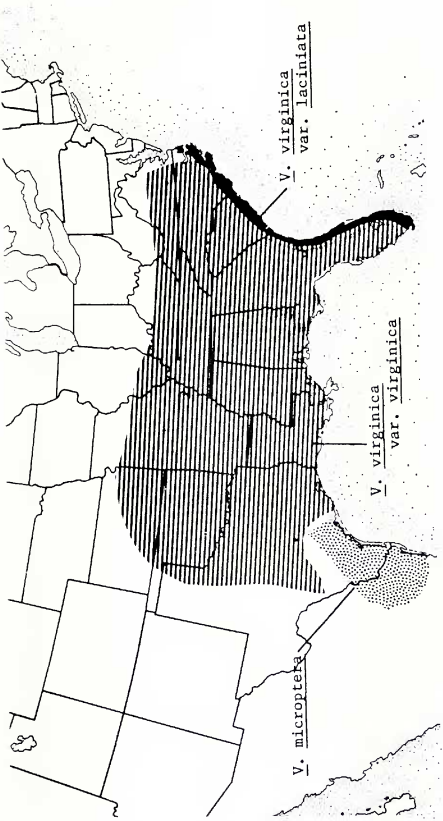


Fig. 1. Distribution of the taxa in the *Verbesina virginica* complex.

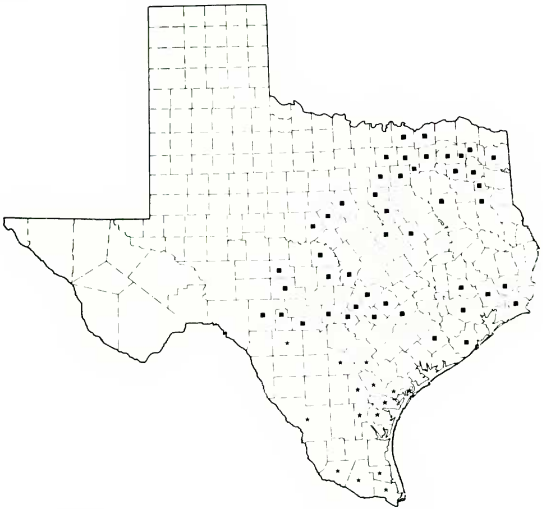

Fig. 2. Distribution of *Verbesina virginica* and *V. microptera* in Texas. *V. virginica* var. *virginica* (squares); *V. microptera* (stars).

The Atlantic coast populations of *V. virginica* differ in several characters from the typical variety. The key differences are the lobing of the lower stem leaves, the indistinct stigmatic lines in the disc floret style branches, acute pale apices and glabrous ray achenes. Long and Lakela (1971) have recognized these populations as *V. laciniata* (Poir.) Nutt., while others (Radford *et al.*, 1968) have accepted them as a variety of *V. virginica.* I am inclined to agree with the latter disposition because of the close morphological similarities between the two taxa. The most consistently reliable character distinguishing the two, leaf morphology, varies continuously from the typical. strongly dentate or serrate form to the sinuately lobed condition found in the coastal areas. Coleman (1977) also supports the latter viewpoint based on hybridization data. The pollen fertility in hybrids between

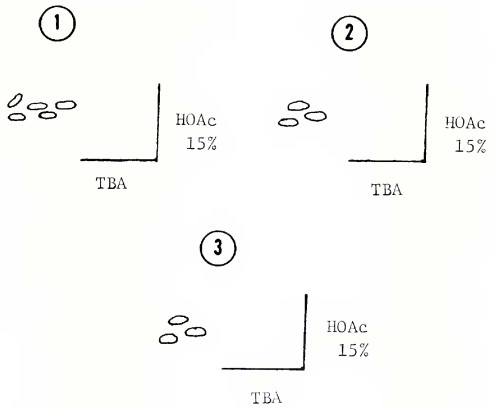


Fig. 3. 2-D chromatographic patterns of flavonoids in the *Verbesina virginica* complex. 1 *V. microptera*; 2. *V. virginica* var. *virginica*; 3. *V. virginica* var. *laciniata*.

*V. v.* var. *laciniata* and *V. v.* var. *virginica* is 93% (compared to eastern and western var. *virginica* crosses which yielded 95% good pollen). This may be compared to the 73% fertility in crosses between *V. microptera* and *V. virginica* var. *virginica* and 41% between *V. microptera* and *V. virginica* var. *laciniata*. Clearly, the coastal United States taxon is more compatible with the typical genome than is *V. microptera*.

Further support for this disposition of taxa can be found in their flavonoid chemistry. *V. virginica* var. *virginica* and *V. virginica* var. *laciniata* produce identical patterns (Figure 3); they each produce three glycosides of kaempferol. *V. microptera* produces those same three compounds and two additional kaempferol glycosides as well. Chromatographically, the two varieties are obviously more closely related to each other than either is to *V. microptera*.

My conclusion, based on these examinations, is to recognize two species, *V. microptera* and *V. virginica*; the latter being comprised of two varieties.

KEY

Ray florets fewer than seven; disc florets fewer than 15. . . . . *V. virginica*
Stem leaves unlobed . . . . . var. *virginica*
Stem leaves lobed or pinnately divided . . . . . var. *laciniata*
Ray florets more than 9; disc florets more than 20 . . . . . *V. microptera*

VERBESINA VIRGINICA L. Sp. Pl. 2:901. 1753. TYPE: USA, Virginia. *Clayton 166.* (Holotype:BM).

Herbaceous perennials, 0.5–3.5 m tall. Stem erect, striate, unbranched until the inflorescence, with (0–)1–6 decurrent wings up to 5 mm wide, vestiture puberulent below to tomentose above. Leaves lanceolate to broadly ovate in outline, laciniately lobed to entire, margins smooth to serrate, upper surface glabrous to scabrous, lower surface tomentose; petioles winged, wings usually decurrent and extending below the base onto the stem. Capitulescence corymbose, ultimate tomentose peduncles less than 1 cm long. Heads to 2 cm in diameter (including the rays); receptacle short-conical. Involucre 2-seriate, bracts oblanceolate, pubescent, keeled by a prominent midevein, outer series short, inner series grading into the pales, apex acute. Pales oblanceolate to weakly trifid, conduplicate, keeled by the prominent midvein, apex acute or acuminate. Ray florets 1–5 (7), pistillate and fertile, corollas white, tube pubescent, 1.6–2.1 mm long, ligule glabrous, 4.4–5.3 mm long, notched at the apex; style branches linear, exserted from the tube. Disc florets 9–13, corollas white, tube short, 0.3–0.6 mm long, pubescent; limb narrowly cylindric, glabrous, 2.3–2.9 mm long; style branches acute, stigmatic lines distinct or indistinct; anthers black, apical appendages acute. Ray achenes black, winged, minutely tuberculate to sparsely pubescent, laterally compressed, 4.1–4.9 mm long, 1.1–2.1 mm wide; wings 0.2–1.2 mm wide; pappus of 2 barbed aristae to 2.5 mm long. Disc achenes black, winged, glabrous, laterally compressed, 4.3–5.7 mm long, 0.9–2.0 mm wide; wings and pappus as in the ray achenes. Flowering Aug.-Dec. Chromosome number, $n = 17$.

VERBESINA VIRGINICA L. var. VIRGINICA—*Phaethusa virginica* (L.) Britton, Ill. Fl. ed. 2, 3:487. 1913.

*Verbesina polycephala* DC. Prodr. 5:616. 1836. TYPE: USA: Texas, Bexar County, "Bejar" (San Antonio). 1828. *Berlandier 1830.* (Microfiche G-DC!, Phototype US! Isotype MO! Sketch GH!).

Variously known as ice plant, white crown beard, frost plant or ice stickweed, *V. virginica* var. *virginica* is a widespread north American weed (Figure 1). It is characterized by unlobed, ovate-lanceolate to broadly ovate leaves. Leaf margins are highly variable, ranging from entire to serrate or dentate. More technical characters of distinction include the acuminate apex of the pales, the distinct stigmatic lines in the disc florets style branches and the sparse pubescence along the ridges at the apex of the ray achenes.

VERBESINA VIRGINICA L. var. LACINATA (Poiret) Gray, Proc. Amer. Acad. Arts 19:11. 1883. —*Siegesbeckia laciniata* Poiret, Enc. Meth. 7:158. 1806. Described from a specimen sent by *M. Bosc.* —*Verbesina laciniata* (Poir.)

Nutt., Gen. 2:170. 1817. —*Phaethusa laciniata* (Poir.) Small, Fl. Miami 195:200. 1913.

*Verbesina sinuata* Elliott, Sk. 2:411. 1823. Types probably at CHARL. Material indicated as sent to Muhlenberg at PH is not there.

*Verbesina virginica* L. var. *insularis* Rob. & Greenm., Proc. Amer. Acad. 34:560. 1899. TYPE: Fernando do Noronha. (an island in the Cape Verde Archipelago) 1887. *Ridley, Lea & Ramage s.n.* (Holotype GH!).

Although other authors regard this as a separate species, the present investigation, as pointed out above, cannot support this view. This variety commonly occurs on sandy soils along the coastal southeastern United States. The variey *insularis* from the Cape Verde Islands is obviously an introduction from the southeastern United States.

VERBESINA MICROPTERA DC., Prodr. 5:616. 1836. TYPE: USA: Texas, "between Laredo and Bejar". 1828. *Berlandier 1442* (Microfiche G-DC!, Isotypes GH! MO! NY! PH!. Phototype US!).

*Verbesina texana* Buckley, Proc. Phila.. Acad. 13:458. 1861. TYPE: MEXICO: Nuevo Leon, near Tantoyuca, province Huasteca, 1858. *Ervenberg 58.* (Lectotype [here designated]: PH! GH!).

*Verbesina microptera* DC. var. *mollissima* Rob. & Greenm., Proc. Amer. Acad. 34:560. 1899. TYPE: MEXICO: Nuevo Leon, Valley near Monterrey. 7 July 1888. *Pringle 1916.* (Holotype GH! Isotypes F! GH! NY(2)! PH!).

Herbaceous perennials to 2.5 m tall. Stems erect, striate, unbranched until the inflorescence; winged; glabrous to puberulent below to tomentose above. Leaves ovate-lanceolate to broadly ovate, margins serrulate, serrate or lobed, apex acuminate or rounded; base narrowing quickly to a winged petiole, the wings continuing down the stem; lower leaves up to 25 cm long, 15 cm wide; pubescence of the upper surface scabrous, lower surface tomentose. Capitulescence a corymb, ultimate peduncles tomentose, less than 1 cm long. Heads to 2.5 cm in diameter (including the rays); receptacle nearly flat. Involucre 2-seriate, bracts oblanceolate, pubescent; keeled by the prominent midvein, apex acute; inner series intergrading with the pales. Pales oblanceolate, conduplicate, keeled by the prominent midvein, 6.0–6.5 mm long, apex acute. Ray florets 11–15, pistillate and fertile; corollas white, tube pubescent, 1.1–1.6 mm long; limb glabrous, 2.7–3.3 mm long, apex with 1 or 2 notches; style branches linear. Disc florets ca. 25; corollas white, tube pubescent, 0.7–1.5 mm long, corolla narrow cylindric, 2.1–2.9 mm long; style branches narrow acute, stigmatic lines distinct; anthers black, apical appendages acute. Ray achenes black, glabrous, laterally compressed, 4.4–4.8 mm long, 1.5–1.8 mm wide; winged by 2 broad wings, 0.3–1.0 mm wide; pappus of 2 barbed aristae to 2 mm long. Disc achenes similar, 3.9–4.5 mm long, 1.4–1.7 mm wide; wings to 1 mm wide; pappus of 2 barbed aristae to 2.5 mm long. Flowering May-Nov. Chromosome number, $n = 17$.

As emphasized above, this taxon differs from *V. virginica* in the number

of ray and disc florets, as well as being geographically separated. Plants of this taxon are further distinguished from *V. virginica* by a more deltoid leaf shape, whereas the leaves of the latter narrow much more gradually along the petiole. *Verbesina microptera* also has much narrower wings on the achenes than either variety of *V. virginica.*

*Verbesina microptera* is closely related to the Mexican taxon *V. rumicifolia* Rob. & Greenm., from which it differs primarily in its leaf pubescence.

## Excluded Taxa

*V. virginica* var. *palmeri* Gray = *V. rumicifolia* Rob. & Greenm.

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